OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT

YUCCA MOUNTAIN QUALITY ASSURANCE DIVISION

QUALITY ASSURANCE SURVEILLANCE REPORT

OF

REYNOLDS ELECTRICAL AND ENGINEERING COMPANY, INC.

SURVEILLANCE YMP-SR-94-005

CONDUCTED AT THE YUCCA MOUNTAIN SITE OFFICE BUILDING AND THE EXPLORATORY STUDIES FACILITY STARTER TUNNEL, AREA 25, YUCCA MOUNTAIN SITE, NEVADA

NOVEMBER 1 THROUGH 16, 1993

ACTIVITIES SURVEILLED:

INSTALLATION OF ROCKBOLTS IN THE EXPLORATORY STUDIES FACILITY STARTER TUNNEL

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1.0 EXECUTIVE SUMMARY

This Surveillance Report of the Reynolds Electrical and Engineering Company, Inc. (REECo) activities contains the results of the Office of Civilian Radioactive Waste Management Quality Assurance (QA) Surveillance YMP-SR-94-005. The surveillance was conducted at the Yucca Mountain Site Office (Building 4015) in Area 25 and at the Exploratory Studies Facility (ESF) Starter Tunnel of the Yucca Mountain Site, Nevada.

The purpose of the surveillance was to verify that pattern rockbolts had been installed in accordance with applicable procedures. Since rockbolt installation has been essentially completed, the only activities in progress were grouting and testing of rockbolts. This surveillance was limited to monitoring of grouting and pull testing of rockbolts and a review of documentation both in the REECo Construction Department and the REECo Quality Control Department. In addition, the Management and Operating (M&O) Contractor, Engineering, Construction, and Quality departments' personnel were contacted.

There was one Corrective Action Request (CAR) issued as a result of this surveillance. The CAR identifies that REECo Construction/Field Engineering incorrectly completed the Rockbolt Installation and Testing Logs (RBITLs). In addition, one deficiency regarding identification if items on a Nonconformance Report (NCR) was corrected during the surveillance. Details of the CAR and the deficiency corrected are contained in Section 5.0.

Three recommendations for the M&O regarding specification YMP-025-1-SP09, Section 02165, and two recommendations to REECo regarding rockbolt statusing, are listed in Section 6.0.

2.0 PURPOSE AND SCOPE

The purpose of this surveillance was to evaluate procedural compliance for the installation of rockbolts in the ESF Starter Tunnel by REECo. The REECo procedures evaluated were TC-581-SP-0011, Revision 2, "Exploratory Studies Facility Ground Support" and TC-581-TP-0002, Revision 1, "Testing of Underground Rockbolt Support."

3.0 SURVEILLANCE TEAM

Raul A. Hinojosa, Surveillance Team Leader, Yucca Mountain Quality Assurance Division (YMQAD)/Quality Assurance Technical Support Services (QATSS)

Robert Harpster, Senior Quality Assurance Specialist, YMQAD/QATSS

4.0 PERSONNEL CONTACTED DURING THE SURVEILLANCE

Jon Hedlund, Field Engineer, REECo
Arthur Watkins, Construction, M&O
Robert Kehrmann, Field Engineer, REECo
Gerald Kiefer, Engineer, M&O
Saeed Bonabian, Engineer, M&O
Bill Waggoner, Quality Assurance, M&O
Paul Bryant, Quality Control Supervisor, REECo
Willie Williams, Quality Control Inspector, REECo
Evert Mouser, Quality Control Inspector, REECo
William Glasser, Quality Assurance Manager, REECo

5.0 SURVEILLANCE RESULTS

As part of the surveillance, various visits were made to the ESF Starter Tunnel. Rockbolt Installation is essentially complete insofar as insertion of the rockbolts into the tunnel back and ribs is concerned. On-going activities observed at the time of the visits, were the application of grout to rockbolts and the pull testing of rockbolts. The measurement of the specific gravity and temperature of the grout by a Quality Control Inspector was also observed. These measurements were performed in accordance with procedural requirements using a Baroid scale (no calibration required) and a thermometer (Temperature Indicator No. Y10672, calibration due date December 3, 1993, Reference: TC-581-SP-0011, Paragraph 6.5.10).

There were a large number of rockbolts to be pull tested due to specification requirements and various NCRs issued during the installation process. This pull testing was in progress at the time of the surveillance and no procedural discrepancies were observed.

The installation of the bearing plates on rockbolts is being held up pending disposition of an NCR issued against these bearing plates. The bearing plates do not meet minimum strength requirements. NCR Hold Tags were observed on some of the installed rockbolts. In addition, the M&O QA Department has installed Hold Tags in accessible locations with the rockbolt identification numbers listed on the Hold Tags. There were also two Hold Tags installed to identify the nonconforming bearing plates.

NCR 93-013 was initiated, validated and issued without any specific rockbolts being identified as nonconforming. This deficiency was corrected during the surveillance by the M&O submitting an addendum to the NCR in the Document Records Center, identifying which rockbolts were nonconforming.

A sample of RBITLs for the top bench were reviewed and it was found that RBITLs were being signed off as completed installations at a point in the installation process where the grouting and pull testing had not been performed. Examples are as follows:

RING 37 Signed off as complete on September 23, 1993.
The following work was performed after the above date:

Grouting completed on October 23, 1993 for Rockbolt Nos. CL, L1, L2, L3, L4, R1, R1.5, R2, R3, and R4.

Pull testing performed on October 20, 1993 for Rockbolt Nos. L, L1, R1, and R2.

Pull testing performed on October 21, 1993 for Rockbolt Nos. L2, L4, and R1.5.

RING 24 Signed off as complete on September 22, 1993.

Grouting was completed on October 25, 1993 for Rockbolt Nos. R4, R3, R2, and R1.

RING 23 Signed off as complete on August 23, 1993.

Grouting was completed on October 25, 1993 for Rockbolt Nos. R1, R2, R3, and R4.

RING 22 Signed off as complete on August 23, 1993.

Grouting was completed on October 25, 1993 for Rockbolt Nos. R1, R2, R3, R4, and R5.

In addition, RBITLs do not have a space for, or include instructions for test results to be annotated, as required by REECo procedure TC-581-SP-0011, Revision 2. These adverse conditions are documented in CAR YM-94-011.

6.0 RECOMMENDATIONS

1. Neither specification YMP-025-1-SP09 nor the installation procedures describe the sequence or timing of rockbolt tightening or a prescribed process/sequence for closeout and acceptance of pattern rockbolt support rings. The logical process would be to sequentially closeout the pattern rockbolt rings from the portal to the face. If this is not materially significant or an item of concern, the specification should so state.

2. Specification YMP-025-1-SP09, Revision 2, Section 02165, Revision 3 for the installation of rockbolts, requires adherence to the manufacturer's instructions and approved contractor's procedures and as shown on the drawings. The contractor's current installation procedures as well as the drawings are not in agreement with the manufacturer's instructions. There is no tensioning of rockbolts prior to grouting as recommended by the manufacturer. This is in accordance with the design basis but is not normal installation practice for rockbolts. The specification should clarify that this is the design basis.

3. The sequence of rockbolt grouting is not specified in the specification (document SP09-02165) nor the installation procedure. This should be specified and the sequence should be from the lowest rib rockbolts to the center line rockbolt. This would preclude grout interference from an upper location rockbolt to a lower rockbolt which has not been grouted.

4. The RBITLs for the initial rockbolt installations (Top Bench) should be redone by REECo Construction. These RBITLs have the following shortcomings:

   a. There are more than one pattern rockbolt ring listed on the RBITLs.
   b. The pattern rockbolt rings listed on these RBITLs are incomplete.

   This creates retrievability problems when determining the status and increases the probability of errors in statusing the rockbolt installations.

5. REECo Construction Department Operations Superintendent should record the results of grout tests and any applicable nonconformance reports on the RBITLs since the RBITLs are QA records.

7.0 ATTACHMENTS

None